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A Comparison of Special Characteristics of Art and Non-Art Seniors from Virginia High School, Bristol, Virginia

Lee Kovacs
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To the Graduate Council:

I am submitting herewith a thesis written by Lee Kovacs entitled "A Comparison of Special Characteristics of Art and Non-Art Seniors from Virginia High School, Bristol, Virginia." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Education.

A. Paul Wishart, Major Professor

We have read this thesis and recommend its acceptance:

E. S. Christenbury, Charles E. Wilson

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

August 12, 1963

To the Graduate Council:

I am submitting herewith a thesis written by Lee Kovacs entitled "A Comparison of Special Characteristics of Art and Non-Art Seniors from Virginia High School, Bristol, Virginia." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Curriculum.

A. Paul Wishart

We have read this thesis and recommend its acceptance:

E. S. Christenbury

Charles E. Wilson

Accepted for the Council:

Dean of the Graduate School

A COMPARISON OF SPECIAL CHARACTERISTICS OF ART AND NON-ART SENIORS FROM VIRGINIA HIGH SCHOOL, BRISTOL, VIRGINIA

A Thesis

Presented to

The Graduate Council of

The University of Tennessee

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

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by

Lee Kovacs

August 1963

ACKNOWLEDGMENTS

Appreciation is expressed to the following persons: To Dr. A. Paul Wishart, chairman of my committee, for his stimulating suggestions and for his careful guidance during the progress of the study, Dr. E. S. Christenbury for his mutual understanding and for his encouragement, and Dr. C. E. Wilson for his interest and cooperation.

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THE PROBLEM

I. STATEMENT OF THE PROBLEM

The purpose of this study was to determine whether or not significant differences exist in academic abilities, aptitudes, and other selected characteristics between art and non-art high school seniors at Virginia High School, Bristol, Virginia.

There were five areas of comparison in this study. Three were concerned with academic achievement, special aptitudes, and intellectual ability. Two general areas concerned class rank and the selection of elective courses.

This study proposed to determine whether or not statistically significant differences exist between the art and non-art students as indicated by scores from standardized tests and from other instruments included in the schools' cumulative files.

Academic achievement was measured by means of the scores taken from six areas of the Sequential Tests of Educational Progress. Special aptitudes were measured by use

of five area tests included within the Differential Aptitude Tests battery, and the intelligence quotient was measured by the California Tests of Mental Maturity. Senior class rank was computed by averaging the student's grade points for the four year period. Selection of academic and non-academic elective courses were tallied and tested by the statistical chi square to determine if differences in selection were significant.

II. HYPOTHESES

This comparative study was designed to test the following null hypotheses:

1. That no significant difference exists in academic achievement of art and non-art seniors as measured by the battery of STEP tests.

2. That no significant difference exists in special aptitudes as measured by selected tests included within the DAT battery.

3. That no significant difference exists in IQ as measured by CTMM tests.

4. That no significant difference exists in class

rank as measured by averaging the students' grades over the four year high school period.

5. That no significant difference exists in the selection of academic and non-academic elective courses taken by art and non-art seniors.

III. LIMITATION OF THE STUDY

This study was limited to 151 graduating seniors selected at random from the population of Virginia High School. There were sixty students enrolled in the elective art course and ninety-one not enrolled in art.

This study was further limited by the number and kinds of standardized tests regularly given by the high school and also by the lack of standardized tests designed specifically to measure artistic aptitudes and abilities. An additional limitation related to the number and kinds of electives available to the student. The choice of electives was determined in part by the local and state standards.

Elective courses, both academic and non-academic, included all courses offered at the high school with the exception of the courses offered in the Vocational program. These special courses excluded were Diversified Occupation,

Diversified Education, and Vocational office training.

This descriptive study did not attempt to predict success in the field of art or to measure aptitudes for artistic ability of students enrolled in art.

Sources of data. Data for the comparative study were taken from the cumulative records maintained by the school for each student.

IV. IMPORTANCE OF THE STUDY

In an effort to improve educational opportunity, parents, educators and students are concerned with the question as to which student should take art, and with the interrelationships that may exist between factors of mental ability, aptitudes and scholastic achievement.

If certain patterns occur relative to course selection, etc., as indicated by the study, the counselor may apply this information to help the student toward his educational goals, and to assist the student in the selection of courses most appropriate for him.

Parents and educators may also find helpful information from the study in recognizing the student's potentialities, especially if they relate to future educational or

vocational plans. By comparing ability levels, the study may help the student to better understand his range of abilities among class and groups, and to evaluate these in terms of his achievement, interest, and aptitudes.

Scholastic aptitude of the pupil is perhaps the most accurate measure of his potential; however, other important aptitudes cannot be ignored, such as those relating to mechanical, abstract, spatial, and artistic abilities. Tests are available in these areas, but only in the case of scholastic aptitudes are they widely used.

In Conant's first recommendation for the American High School, he discussed the importance of viewing the student from many facets of his personality. Conant discussed the role of the counselor in assisting the student in interpreting his individual range of test results. He emphasized the need for a balanced elective program in the following statement:

> Through consultation, an attempt should be made each year to work out an elective program for the student which corresponds to the student's interest and ability as determined by tests of scholastic aptitude, and recorded achievement as measured by grades in courses.[1]

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[1]James B. Conant, The American High School Today (New York: The McGraw-Hill Book Company, 1958), pp. 44-45.

School administrators emphasized the importance of more adequate instruments for evaluating educational growth at a meeting of the American Association of School Administrators, held on February 18, 1959.

> There is a great need for important and more adequate instruments for evaluation of many kinds of educational growth. The misuse of tests and the misinterpretation of test data continue to be a glaring danger to good educational programs. Any test instrument should be selected and used in terms of what the particular school has intended to teach. To judge a school solely on the basis of the data derived from any battery of examinations is an invalid and dangerous venture. State and national examination results, used without due regard for the educational objectives of the school and the nature of the student body, are likely to be misleading.[2]

It is necessary for teachers, counselors, and school administrators to make judgments concerning the student's potential and to assist him in achieving the maximum development of which he is capable. The present comparative study may indicate some need for improving the instructional program by evaluating the student's success on the basis of his needs for learning both in academic and in other areas of knowledge such as art.

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[2]American Association of School Administrators, Resolution Number 12 (Adopted by the American Association of School Administrators, February 18, 1959), p. 3.

In Bush's discussion on the influence of the art as it relates to the total school program, he stated:

> One of the delightful features of the program of arts and crafts is the life given to the entire school program by the teachers and the pupils directly engaged in it. The "creative" approach, act, or urge, by whatever name it is called, is not confined to or indeed always found in art classes. A sterile, pedantic, and routine approach to learning may be found in art classes as well as in other subject fields. But there is often in the art subjects and among the art teachers an abundance of original, unorthodox, and spontaneous energy that attracts and motivates pupils beyond the ordinary routine and causes them to see relationships with and applications to other phases of their school activities and to living outside of the school.

V. DEFINITION OF THE TERMS

Achievement tests. Achievement tests in this study shall refer to the measurement of certain acquired information or skills, the extent to which a person has learned as a result of specific instruction.

Aptitude. Aptitude shall be applied to the combined characteristics and abilities either native or acquired, and believed to be indicative of the student's ability to learn a particular subject area.

Class rank. Class rank refers to the position held by the student at time of graduation. This position is

determined by calculating the grade point average the student has received during his four years of high school.

Intelligence quotient. In this study the IQ shall mean the ratio of a student's mental age ($\frac{ma}{ca}$) or, a measure of the brightness that takes into account both age and score on an intelligence test.

Percentile rank. Percentile rank will be applied to the per cent of test scores in a distribution equal to or lower than the score corresponding to the given rank.

Scholastic aptitude. Scholastic aptitude shall refer to the student's ability to learn by performing certain mental activities which are regarded as evidence of intelligence.

Grade point average. Using a scale of 4 equal to A; 3, to B; etc., the grades were averaged for the four years.

VI. INSTRUMENTS USED IN THE STUDY

Sequential Tests of Educational Progress (STEP). Six individual tests are included in this series of tests designed to measure development in the following areas: reading,

writing, listening, social studies, science, and mathematics. In this study the raw scores were used as the basis for comparison.

Differential Aptitude Tests (DAT). The DAT tests represent an integrated battery of eight separate tests in the following areas: verbal reasoning, numerical ability, abstract reasoning, space relations, mechanical reasoning, clerical speed and accuracy, and language usage.

For the purpose of this study, five selected areas of the DAT tests were used in the comparison. The following tests were used: verbal reasoning, numerical ability, abstract reasoning, space relations, and mechanical reasoning. The clerical speed and accuracy test scores were not used because these tests related more specifically to vocational aptitudes which were not included in this study. The language usage test was not used because both the STEP and CTMM also measure a language factor.

California Test of Mental Maturity (CTMM). The seven tests in the CTMM contribute scores in four factors: spatial relationships, logical reasoning, numerical reasoning, and the verbal concept. These tests as indicated above are

designed to test various kinds of mental processes and to establish the level and rate of the student's mental development.

The CTMM utilizes mental age, intelligence quotients, (IQ) and percentile rank to express the relationship of individual performance to that of the standardization sample. Converted scores were used in this study.

Class rank. The class rank compared in this study represents a grade point average for four years.

Elective courses. Academic and non-academic electives for the two groups were tallied from the student's cumulative records.

VII. ORGANIZATION OF STUDY

This study is concerned with two groups of high school seniors--one group enrolled in an elective art course and one group not electing art.

Chapter I deals with the problem, importance and limitations of the study, and the way in which the study is organized.

Chapter II is concerned with descriptive data and

procedures including a review of the population, the philosophy of the school and a description of the curriculum.

Chapter III presents the review of literature and discusses recent research in the area.

Chapter IV contains the findings of the study and statistical tables.

Chapter V contains the summary and conclusions and also implications for further study.

CHAPTER II

DESCRIPTIVE DATA AND PROCEDURES

I. REVIEW OF THE POPULATION

Some knowledge of the area in which Virginia High School is located is important to the scope of the study since environmental conditions influence the student in his scholastic endeavor.

The City of Bristol is located in the Southern Highlands where the Virginia and Tennessee state lines meet. Since 1900 Bristol has grown from a community of 9,000 people to one of approximately 42,000 in the metropolitan area with an estimated population of 20,000 on the Virginia side of town. Both cities, Bristol, Virginia, and Bristol, Tennessee, are included in the description of the population; however, this study is concerned with the Virginia side of Bristol which is served by Virginia High School.

Located within the city or its immediate fringes, are 65 industries employing approximately 13,000 persons. A variety of products is produced, ranging from textiles to missiles, which contribute to the stable economy of the

population. Bristol also serves the surrounding area as a distribution center for agricultural products and for livestock sales.

Three colleges are located in Bristol: Virginia Intermont College and Sullins College, both of which are Junior Women's Colleges; and King College, a four year co-educational college.

Sixty-five churches are located in the city with the Protestant influence predominating.

II. PHILOSOPHY OF THE HIGH SCHOOL

Virginia High School seeks to create an environment and to provide experiences which are conducive to building good citizenship in a free democracy. The fundamental purpose of the school is to assist each individual in achieving the maximum development of which he is capable. Objectives in the program pertain to development of learning appreciation, attitudes, ideals, and emphasizing the importance of the acquisition of knowledge, learning habits, and skills that will bring satisfaction to the individual and to others.

To further state the purpose of the school:

> We consider the public school system one of society's "tools" for the propagating of our democratic way of

> life. Since such a way of life is governed by the people, a role our children will inherit, we feel that such propagation is directly proportional to the way in which our youth is prepared to meet this challenge.
>
> This preparedness is accomplished through the cooperative effort of the home, church, and school. We fully realize these institutions are inseparable and overlap in the pupil's total development, but we are here concerned primarily with the school's responsibility for helping to achieve this preparedness.
>
> We consider our doors open to all youth; and for those that enter, every effort will be made to recognize their abilities and to develop them to their fullest potential, so they may assume their rightful place in society.[1]

In keeping with the philosophy to assist the individual student to achieve his full potential, this study attempts to identify areas in special aptitudes which may prove helpful to the students, parents and to school personnel.

III. DESCRIPTION OF THE CURRICULUM

Virginia High School is an accredited member of the Southern Association of Colleges and Secondary Schools, and accredited by the Virginia State Department of Education.

The high school program embraces the work of four

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[1]Philosophy of Virginia High School, Student Handbook, 1962, p. 8.

years of high school, grades nine through twelve, with the minimum of eighteen units required for the 1963 graduating seniors.

Classification of the students in the high school is based upon the number of Carnegie Units of high school work the student has completed at the beginning of the regular school session.

The normal academic load is four units of work for the regular session. Students with exceptional ability may, with the approval of the principal and parent, be permitted to carry as many as five units of academic work. With such approval, a student may also be permitted to carry only three units of work.

Approximately 52 per cent of the 1963 Virginia High School graduating class have been accepted at an accredited college for the fall of 1963. Some of the remaining seniors will attend trade schools; others will go directly into a vocation of their choice.

Art courses at three different levels are offered at Virginia High School on an elective basis. Students desiring to take art request the guidance department to schedule this course for them. Of the 151 graduating seniors 39.74 per

cent were enrolled in art classes.

Of the students electing art thirty-one were females and twenty-nine were males. From these figures it can be seen that 52 per cent of the students taking art were female and 48 per cent were male. In the group not electing art there were fifty-seven females and thirty-four males or 63 per cent females and 35 per cent males.

Grading system. The student's class rank is determined by averaging grades in both academic and non-academic areas over a period of four years of high school.

The letter grade system is used at Virginia High School. Letter grades are assigned to each student to indicate the degree of achievement in academic, elective, and citizenship ratings.

The student receives a letter grade indicating his achievement in each of his subjects as listed:

A - indicates outstanding achievement for the particular grading period

B - indicates achievement above average

C - indicates quality and achievement to be expected of the student with average ability

D - indicates the quality of achievement which is below average in a particular subject but still considered passing

F - indicates unsatisfactory and unacceptable achievement, if maintained throughout the session no credit will be given for the course

In addition to achievement grades, the student receives a citizenship grade which reflects his attitude, effort, and conduct.

A - outstanding

B - superior

C - average

F - unsatisfactory

Report cards are issued at the end of each six weeks. Semester grades are obtained by averaging the grades received for the three six-week grading periods and the grade received by the student on the final semester examination.

IV. PROCEDURE

Permission was granted by the principal of Virginia High School to obtain and use information for this study from the cumulative folders of 151 graduating seniors.

These data recorded for the study were collected from the cumulative records which are maintained on each pupil enrolled in the high school. Data from the records were

considered valid because they represented the recording and maintenance of current information concerning the student that was recorded by school personnel over a period of several years.

Instruments used by the school to compare the student's intellectual abilities, special aptitudes and academic achievements were the following standardized tests:

1. Sequential Test of Education Progress (STEP)
2. Differential Aptitude Tests (DAT)
3. California Test of Mental Maturity (CTM-I2)

Data from the standardized tests, six areas of the STEP and five areas of the DAT, were analyzed by the statistical t-test as a means of testing the null hypotheses that no significant differences exist in academic ability or special aptitudes of the seniors enrolled in the elective art course as opposed to those not taking art.

The student's IQ as used in this study took into account both mental and chronological age and was determined by converted CTMM test scores. The t-test was applied to test the null hypothesis that no significant difference exists in the IQ of the art and non-art groups.

Class rank held by the student was determined by

calculating the grade point average received by the student during his four years of high school. Again the t-test was used to test the null hypothesis that no significant difference exists in class rank of art and non-art students.

Academic and non-academic elective courses selected by the two groups were compared to test the null hypothesis that no significant difference exists in the selection of academic and non-academic elective courses. The statistical technique used to test these data was the chi square test.

CHAPTER III

REVIEW OF RELATED LITERATURE

Recent research. During a search of the literature the writer found research studies which dealt with a number of the specific areas of this study.

Eiduson reported, in a study comparing art and non-art behaviorial patterns, that many of the studies have unwittingly served to reinforce some of the previous stereotype notions that many people have about the artist:

> . . . that they are persons apart from other persons, that their very separateness and uniqueness are in some way essential ingredients for their productivity and for the contributions they make.[1]

The major hypothesis tested in the Eiduson study was "that artists, persons whose vocations are in the arts, are significantly different in characteristics of thinking and perception, in personality make up and motivational structure, from non-artist persons."[2]

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[1] Bernice T. Eiduson, "Artist and Non-Artist, A Psychological Study" (unpublished doctoral dissertation, The University of California, Los Angeles, 1957), p. 13.

[2] Ibid., p. 14.

Eiduson concludes that the major psychological and other difference in the art and non-art person lies in his thinking and perceiving:

> The quantitative results indicate that it is primarily in their ways of thinking and perceiving that artists show the marked difference from non-artists. As a group, artists were shown to look for ways of thinking which are original and unusual and actually to display novelty in their thinking. They organize and combine ideas so that they become unusual conceptions, and show richness in their associations and ways of expression. They display a breadth of interest which point more in the direction of theoretical and abstract than in that of the realistic and practical. Artists, furthermore, were shown to accept reality but tend to perceive it in a way which is different from that of the non-artist. They are extremely responsive to sense data, and seek out the subtle and delicate in impressions.

Eiduson emphasizes divergent characteristics that tend to influence the artistic person's thinking.

> Their thinking is marked by a great deal of elaborated fantasy; they are able to tolerate ambiguity in perception and also have the ability to loosen or relax their thinking without accompanying personality disorganization.[3]

In further describing the personality of the artist, Eiduson states:

> The personality of the artist shows sensitivity to his needs and to those of others. He can establish a multiplicity of identifications and can communicate his

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[3] Ibid., p. 25.

> feelings and experiences so that others respond. He shows capacity for sensuous gratification. He tends to channel his agression into intellectualized or sublimated activities.[4]

Eiduson has identified and described personality factors that relate to the artistic type person. These factors, however, are not revealed in the general area of measurements used in this study.

Bolvin investigated the interrelation of factors that may exist between subject preference, mental ability, and scholastic ability in the area of mathematics, science, social studies, and language. The intent of Bolvin's study was to answer the general question: "What interrelation may exist between factors of mental ability and subject preference that is reflected in student's scholastic accomplishment?"[5]

In general, the findings from Bolvin's study supported the null nypotheses as expressed in this study. In summary, Bolvin's major hypotheses contends that mental ability and

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[4]Bernice T. Eiduson, "Artist and Non-Artist, A Psychological Study" (Unpublished Doctor's dissertation, The University of California, Los Angeles, 1957), p. 26.

[5]John Orvard Bolvin, "Interrelation of Mental Ability and Subject Preference in Scholastic Achievement" (unpublished Doctor's dissertation, University of Pittsburg, 1958), p. 12.

interest preference are related to the student's accomplishment in a given subject and to his accomplishment in different subjects collectively.[6]

One of the major problems confronting curriculum builders in Bristol or other areas is to provide learning experiences that are flexible enough in nature to enhance the student and to nurture his aptitudes and his intellectual abilities.

It cannot be assumed that the seeds of talent always fall on fertile ground. Growth must be nurtured. Federal, state, and local governments are therefore pooling their resources in an effort to identify the talents of boys and girls and to foster their growth.[7]

From a study based on this controversial subject of academic courses versus the non-academic courses, Amend explains the need for curriculum evaluation:

> An important concern of American educators is the Public High School curriculum. This curriculum, always subject to the social, economic, and political realities

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[6] Ibid., p. 14.

[7] Lawrence G. Derthick, Testing (Washington: U. S. Department of Health, Education and Welfare, Government Printing Office, 1960), p. v.

> of society, has in the last ten years, become an object of controversy. The literature is replete with criticism and there are demands that the high school program be limited to strictly academic pursuits. Parents, teachers and youth are confused and anxious proponents of the arts and are concerned lest these experiences be neglected.[8]

Amend further supported his study concerning the choice of elective courses:

> Counselors expressed opinions which strongly supported choice of electives from among the arts and student activities. Counselor opinion supported choice of activities more strongly than did the opinions of either parent or teacher.[9]

Smith examined the possible relation between student's relative accomplishment in mechanical arts and their interest in other subject areas. He also commented on the degree of cognate relationships found between mental aptitudes and scholastic accomplishments.

> A relative high degree of independence was found between accomplishment scores in both mental ability and relative subject preference scores. This finding was consistent with previous studies and indicated that some form of relationship other than independent and linear must exist, because both were empirically recognized to be potent factors in relation to

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[8] John Amend, The Relative Emphasis on the Academic Courses Versus the Arts and Student Activities in High School. New York University, 1961, pp. 42-88.

[9] Ibid.

accomplishment.[10]

The arts have achieved increasingly greater status in modern education during the past decades. Fewer and fewer persons cry out against them as fads and frills, and recognized leaders in increasing numbers staunchly support them when they are attacked. The main reason for the prominent place being assumed by the arts in education is the stronger position that they now occupy in community, business, and industrial life. This is but another example of the reflection of a change in community life that laggardly makes its way into school practice.[11]

Bush contends the present problem concerning art in high school lies in curriculum planning:

> The question that now confronts the secondary schools is no longer whether or not the arts should be included as a basic part of the general education of all youth in school, for that has already been decided in the larger cultural context. What remains is the working out of the details by means of which this shall be accomplished. It should not be assumed that this is unimportant, for

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[10] James Glenn Smith, Ed.D., "Study of Scholastic Accomplishments in Secondary Schools, Mechanical Arts in Relation to Pupils Preference for Subject." Dissertation Abstracts - #17, 1957 - As 30 M-5, University of Pittsburgh, 1957, pp. 1015-1016.

[11] Robert N. Bush, "The Arts and Secondary Education--A Creative Potential," California Journal of Secondary Education, April, 1953, pp. 182-183.

> as with many affairs of life, it is in the execution of the detail that the main goal is either obscured or brought sharply into focus. In a democracy especially the ends tend to intertwine and bury themselves in the means.[12]

Discussing the need for art in high school, Bush asserts:

> The colleges and universities in their admission and graduation requirements are only tardily recognizing the academic respectability of the arts and still must be counted as a deterring force in the expansion of creative activities in the secondary schools.[13]

As art enhances the entire school program, it will also enable us to see the essential unity of human experiences.

In assessing the creative abilities of high school students, Torrance points to the neglected high school years:

> Of the different educational levels, the high school years have perhaps been the most neglected in creativity research. Information has accumulated concerning the preschool and elementary school years because of interest in creative imagination. Apparently, educators have not had much interest in the creative development of high school students. Information has accumulated concerning creativity during the college years, because many outstanding creative artists, scientists, writers, and performers of many kinds began their productivity during these years, and because it has been deemed

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[12] Ibid., p. 182.

[13] Ibid.

> appropriate for colleges to produce professionally trained people who will make creative contributions. No such expectations exist for high schools.[14]

Commenting on the necessity for identifying creativity, Torrance sets forth a number of arguments based on the need for early identification:

> Great necessity lies in the serious efforts to identify creative talent early in life, and to study the forces which impinge its development. Scientific research is needed to develop information concerning the nature of creative thinking in high school in order to make possible the changes needed in education.[15]

In Bush's discussion on the influence of the art as it relates to the total school program, he states:

> One of the delightful features of the program of arts is the life given to the entire school program by the teachers and the pupils directly engaged in it. The "creative" approach, act, or urge, by whatever name it is called, is not confined to or indeed always found in art classes. A sterile, pedantic, and routine approach to learning may be found in art classes as well as in other subject fields. But there is often in the art subjects and among the art teachers an abundance of original, unorthodox, and spontaneous energy that attracts and motivates pupils beyond the ordinary routine and causes them to see relationships with and applications

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[14] E. Paul Torrance, Guiding Creative Talent (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1962), pp. 28-29.

[15] Ibid., p. 42.

> to other phases of their school activities and to living outside of the school.[16]

Art in Virginia High School follows a similar pattern as described by Bush in the above paragraph. An attempt is made to provide experiences that are varied and flexible, a program that is broad in scope and one that reaches out to enhance the entire school curriculum. Objectives in the program are designed to meet the student's needs by encouraging his creative development and aesthetic enjoyment. If he tends to be concerned with learning artistic skills, then these are encouraged, especially for those who plan for further study in the area. Art appreciation is stressed in terms of evaluation by the technique of helping the student to perceive the form in art, and to grasp relationships between visible details and understand associated meanings of good design.

Aside from early identification, Stalnaker contends: "We must do more than identify. We must stimulate, and we must encourage these creatively talented people and inform

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[16] Ibid., p. 183.

them of the responsibility which is theirs."[17]

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[17]John M. Stalnaker, "National Education Association," Academically Talented (Washington, D.C.: The Conference Report, February, 1958), p. 18.

CHAPTER IV

INTERPRETATION OF THE DATA

The instruments used in the interpretation of data were concerned with measurement of academic achievement, special aptitude, and intelligence quotient. Instruments used in this chapter for the analysis of the data were:

1. Sequential Test of Educational Progress (STEP)
2. Differential Aptitude Test (DAT)
3. California Test of Mental Maturity (CTMM)

Raw scores from six areas of the STEP tests and from five areas of the DAT tests were used for the comparison. The converted raw scores of the CTMM were used to determine the students' IQ.

Data relating to hypothesis four (class rank) and to hypothesis five (academic and non-academic electives) were taken from the cumulative files retained by the school on each student. Class rank was assigned by rank-order computed on the basis of grade point average over the four year high school period. Academic and non-academic elective course selection was recorded in terms of comparing the frequencies

of selection made by the two groups.

Differences between the two groups in academic achievement, special aptitudes, intelligence quotient, and class rank were checked for statistical significance by using the t-test. Sample numbers of two groups that were equal required a simple formula for the t-test; however, in this instance the entire population of the graduating class was used and the sample numbers of the groups compared were unequal. It was necessary, therefore, to find a specific formula designed to describe this particular population.[1] The selection of academic and non-academic subjects was compared by use of the chi square test.

In Table I a comparison of the means of the six areas of the STEP tests are shown for the two groups of students. There was little difference in the means of the areas measured and the t-test showed these differences to be insignificant at the .10, .05, and .01 confidence levels. The mean for the art group was slightly higher in the area of social studies, science and reading as opposed to the

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[1]George Waddel Snedecor, Statistical Methods Applied to Experiments, Iowa State College Press, 1956, p. 87.

TABLE I

COMPARISON OF MEANS OF STEP SUBJECT AREA SCORES FOR ART AND NON-ART STUDENTS

	Art	Non-Art	t-value
Mathematics	271.13	273.79	.058
Social Studies	275.58	273.30	.049
Listening	287.70	289.14	.029
Science	279.01	277.29	.036
Reading	289.01	287.12	.039
Writing	284.98	285.34	.007

Critical t-value at .10 level = 1.660
Critical t-value at .05 level = 1.984
Critical t-value at .01 level = 2.625

slightly higher mean in mathematics, listening, and writing for the non-art group.

The fact that the mean score in science for the art group tended to be higher than the non-art group may conceivably indicate an unexpected result because there seems to be some general feelings that artistic people are not scientifically oriented. The STEP tests as designed were intended to measure academic achievement, and, therefore, the means of these tests should be somewhat indicative of the level of the individual student's abilities. They might also reflect, to varying extents, his previous scholastic experiences.

A comparison of the means of the areas of the DAT test for the art and the non-art groups is shown in Table II. Again, little difference was noted and the t-test showed no significant differences at the .10, .05, and .01 levels. The mean score of the non-art group was higher in the area of abstract reasoning. The mean score in the space area was slightly higher for the art group than for the non-art students. A higher mean score for the non-art was shown in areas of mechanical reasoning, verbal talents, and numerical reasoning.

TABLE II

COMPARISON OF MEANS OF DAT AREA SCORES FOR ART AND NON-ART STUDENTS

	Art	Non-Art	t-value
Abstract	21.91	24.18	.521
Space	33.85	31.51	.369
Mechanical	26.26	29.56	.627
Verbal	13.58	17.51	1.286
Numerical	15.25	19.25	1.231

Critical t-value at .10 level = 1.660
Critical t-value at .05 level = 1.984
Critical t-value at .01 level = 2.625

There was a greater margin of difference between the two groups in the area of verbal and numerical ability. Non-art students had higher scores but none of the scores was statistically significant.

Table III shows the means and the t-values for class rank and IQ. The mean of the class rank was higher for the art group while the mean of the IQ was higher for the non-art group. Both differences were statistically insignificant at the .10, .05 and .01 levels. These differences, although insignificant from a statistical point of view, have some utility value in that the two areas would generally be expected to reflect a reasonably homogeneous pattern. Diagnosis on the basis of these inconsistencies suggest further research.

In Table IV the academic elective courses are listed with the number of the art and non-art students who selected a particular course. This is a descriptive table in that it presents the numerical frequency and the tabulated distribution of the selections made by the two groups. It may be noted that the total figures from the table represent raw scores and cannot be used on a comparative basis in that the two groups were not numerically matched samples.

TABLE III

COMPARISON OF MEANS OF CTMM SCORES AND CLASS RANK FOR ART AND NON-ART STUDENTS

	Art	Non-Art	t-value
Class Rank	90.06	73.92	1.032
I.Q.	102.18	103.62	.083

Critical t-value at .10 level = 1.660
Critical t-value at .05 level = 1.984
Critical t-value at .01 level = 2.625

TABLE IV

NUMBER OF ACADEMIC ELECTIVE COURSES TAKEN BY ART AND NON-ART SENIORS FROM THE 1963 GRADUATING CLASS FROM VIRGINIA HIGH SCHOOL, BRISTOL, VIRGINIA

Name of Course	N = 60 Art	N = 91 Non-Art
World Geography	32	52
World History	15	15
Algebra II	66	33
Plane Geometry	28	43
Solid Geometry and Trig.	11	22
French	9	15
Spanish	17	35
Biology	43	65
Chemistry	30	49
Physics	12	19
Total Academic Electives	244	390

Similar data for the non-academic electives were shown in Table V. The practical significance of this table may be examined on the basis of the frequency of choice.

It is noteworthy to examine the totals from Tables IV and V for the purpose of observing differences in the art and non-art students' selection of electives. For the academic elective choice of art students the total was 244 and in the non-academic choice, the art students selected 252 electives. The range of difference in elective course selection for the non-art students showed 91 non-art students enrolled in 390 academic courses as compared to 258 courses in the non-academic area.

Table VI represents a contingency table using the total elective course selections taken from Tables IV and V. From this descriptive table the art students seem to show a tendency toward non-academic electives, while the non-art students' preference was toward the academics. The statistical chi square test showed the differences to be insignificant at the .10, .05, and .01 levels. The selection tendency, although not statistically significant, may imply some need for further investigation.

TABLE V

NUMBER OF NON-ACADEMIC ELECTIVE COURSES TAKEN BY ART AND NON-ART SENIORS FROM THE 1963 GRADUATING CLASS FROM VIRGINIA HIGH SCHOOL, BRISTOL, VIRGINIA

Name of Course	N = 60 Art	N = 91 Non-Art
Art	60	0
Speech	27	1
Home Economics	19	35
Chorus	5	14
Band	6	7
Typing	45	76
Shorthand	12	12
Business Mathematics	8	19
Office Training	18	19
Mechanical Drawing	18	30
Shop	10	17
General Business	22	28
Total Non-Academic Electives	252	258

TABLE VI

ACADEMIC AND NON-ACADEMIC ELECTIVE COURSES SELECTED BY ART AND NON-ART SENIORS FROM THE 1963 GRADUATING CLASS OF VIRGINIA HIGH SCHOOL, BRISTOL, VIRGINIA

Courses/Groups	Art	Non-Art
Academic	A 244	B 390
Non-Academic	C 252	D 258

$$\chi^2 = \frac{(AD - BC - \frac{n}{2})^2 n}{(a+b)(a+c)(b+d)(c+d)}$$

$$\chi^2 = 1.8315$$

Critical value at .05 level = 3.841
Critical value at .10 level = 2.706

A contingency table using the totals from Tables IV and V.

SUMMARY

The results discussed in this chapter revealed no significant difference in the means of the various instruments used to compare the art and non-art groups. In some areas, however, there were interesting tendencies which would seem to provide a basis for further study.

CHAPTER V

I. SUMMARY

This study was designed to compare the special characteristics of two groups of high school students to find if differences existed that were statistically significant. The art and the non-art seniors were compared on the basis of standardized test scores concerned with measuring areas in academic achievement, special aptitudes, and intelligence quotient. Two other areas compared were class rank and the selection of academic and non-academic elective courses, these areas were analyzed by classified frequencies.

In Table VII a comparison of the means of the areas the STEP test are shown for the two groups of students. The fact that the art group means were higher in social studies, science, and reading might suggest higher scores of the non-art group in mathematics, listening, and writing.

A comparison of the means of the areas of the DAT tests for the art and non-art groups as shown in Table VII also lacked significance. Again little differences were noted which supported the null hypothesis. On these tests the art

TABLE VII

COMPOSITE TABLE OF MEAN SCORES FOR ART AND NON-ART STUDENTS

STEP	Art	Non-Art	t-value
Mathematics	271.13	273.79	.058
Social Studies	275.58	273.30	.049
Listening	287.70	289.14	.029
Science	279.01	277.29	.036
Reading	289.01	287.12	.039
Writing	284.98	285.34	.007
DAT	**Art**	**Non-Art**	**t-value**
Abstract	21.91	24.18	.521
Space	33.85	31.51	.369
Mechanical	26.26	29.56	.627
Verbal	13.58	17.51	1.286
Numerical	15.25	19.25	1.231
	Art	**Non-Art**	**t-value**
I.Q.	102.18	103.62	2.083
Class Rank	90.06	73.92	1.032

Critical t-value at .10 level = 1.660
Critical t-value at .05 level = 1.984
Critical t-value at .01 level = 2.625

group showed higher but non-significant means in space; the non-art group, in abstract, mechanical, verbal, and numerical areas.

Table VII also shows the means and t-value for class rank and IQ which showed no significant differences.

II. CONCLUSIONS

As was indicated in the statement of the problem, this study proposed to determine whether or not significant differences existed by comparing special characteristics of two groups of high school seniors.

Factors used to compare the two groups were academic achievement, special aptitudes, student's IQ, senior class rank and the selection of academic and non-academic courses.

The two groups represented the total population from Virginia High School 1963 graduating class, sixty of which were enrolled in the elective art course as opposed to ninety-one seniors not taking art.

On the basis of the major findings from this study obtained by comparing measurements of the two groups, the null hypothesis was accepted as follows:

1. That no significant difference existed in academic

achievement of art and non-art seniors as measured by STEP tests.

2. That no significant difference existed in special aptitudes by comparing DAT results.

3. That no significant difference existed in the IQ of the two groups.

4. That no significant difference existed in class rank of the art and non-art seniors.

5. That no significant difference existed in the selection of academic and non-academic elective courses.

III. IMPLICATIONS

The lack of significant differences between art and non-art students as revealed by this study failed to support the general belief that there were major differences between the art and non-art groups in scholastic achievement, aptitudes, and IQ. Careful analysis of the individual measurements might indicate a trend toward improved understanding and appreciation of the arts.

A study focused on personality structure of art students may offer interesting possibilities for experimental research.

No attempt has been made to test the efficacy of the time-worn cliches concerning the artistic temperament, general ability of the artist, and the academic acceptability of the artist's personality.

The complexity of the individual factors presents a challenge for further research in attempting to determine the sources of human variabilities. The major question may focus on the component parts of the personality and in finding ways to identify these factors which seem to influence the wide range of differences in student performances.

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